EXHIBIT B – CLAIM 37 OF THE ’304 Patent

37. A method for reference signal pattern allocation for a mobile device in a wireless communication system, the method comprising:	To the extent the preamble is limiting, Volkswagen’s cars include telematics modules that practice this limitation. For example, the telematics modules and related communications technology in the car implement the following standards which practice the claimed invention: [1] TS 36.211 3GPP TSG RAN; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation (Release 10), v 10.2.0 (2011-06) In particular, for example, the procedures set forth in TS 36.211 3GPP TSG RAN; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation (Release 10), v 10.2.0 (2011-06) provide for reference signal pattern allocation. 6.10.3.2 Mapping to resource elements
receiving a plurality of physical resource blocks (PRBs) to from a eNodeB; and	This limitation is present in the Accused Products. For example, 3GPP standard TS 36.211 3GPP TSG RAN; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation (Release 10), v 10.2.0 (2011-06) describes how the standard provides for receiving a plurality of physical resource blocks to from a eNodeB: TS 36.211 3GPP TSG RAN; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation (Release 10), v 10.2.0 (2011-06) 6.10.3.2 Mapping to resource elements For antenna port 5, in a physical resource block with frequency-domain index n_{PRB} assigned for the corresponding PDSCH transmission, the reference signal sequence $r_{n_s}(m)$ shall be mapped to complex-valued modulation symbols $a_{k,l}^{(p)}$ with $p=5$ in a subframe according to: Normal cyclic prefix: … The mapping shall be in increasing order of the frequency-domain index n_{PRB} of the physical resource blocks assigned for the corresponding PDSCH transmission. The quantity $N_{\mathrm{RB}}^{\mathrm{PDSCH}}$ denotes the bandwidth in resource blocks of the corresponding PDSCH transmission. Figure 6.10.3.2-1 illustrates the resource elements used for UE-specific reference signals for normal cyclic prefix for antenna port 5. Figure 6.10.3.2-2 illustrates the resource elements used for UE-specific reference signals for extended cyclic prefix for antenna port 5. … For antenna ports $p=7$, $p=8$ or $p=7,8,\ldots,\upsilon+6$, in a physical resource block with frequency-domain index n_{PRB} assigned for the corresponding PDSCH transmission, a part of the reference signal sequence $r(m)$ shall be mapped to complex-valued modulation symbols $a_{k,l}^{(p)}$ in a subframe according to Normal cyclic prefix: …

using a plurality of reference signal patterns same as a plurality of OCC reference signal patterns multiplied with the associated DM RS signal on the received PRBs according to an OCC mapping rule,	This limitation is present in the Accused Products. For example, 3GPP standard TS 36.211 3GPP TSG RAN; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation (Release 10), v 10.2.0 (2011-06) describes how the standard provides for using a plurality of reference signal patterns same as a plurality of OCC reference signal patterns multiplied with the associated DM RS signal on the received PRBs according to an OCC mapping rule: TS 36.211 3GPP TSG RAN; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation (Release 10), v 10.2.0 (2011-06) 6.10.3.2 Mapping to resource elements … For antenna ports $p=7$, $p=8$ or $p=7,8,\dots,\upsilon+6$, in a physical resource block with frequency-domain index n_{PRB} assigned for the corresponding PDSCH transmission, a part of the reference signal sequence $r(m)$ shall be mapped to complex-valued modulation symbols $a_{k,l}^{(p)}$ in a subframe according to Normal cyclic prefix: $$a_{k,l}^{(p)} = w_p(l')\cdot r(3\cdot l'\cdot N_{\mathrm{RB}}^{\max,\mathrm{DL}} + 3\cdot n_{\mathrm{PRB}} + m')$$ where $$w_p(i) = \begin{cases} \overline{w}_p(i) & (m'+n_{\mathrm{PRB}}) \bmod 2 = 0 \\ \overline{w}_p(3-i) & (m'+n_{\mathrm{PRB}}) \bmod 2 = 1 \end{cases}$$ $$k = 5m' + N_{\mathrm{sc}}^{\mathrm{RB}} n_{\mathrm{PRB}} + k'$$ $$k' = \begin{cases} 1 & p \in \{7,8,11,13\} \\ 0 & p \in \{9,10,12,14\} \end{cases}$$ $$l = \begin{cases} l' \bmod 2 + 2 & \text{if in a special subframe with configuration 3, 4, or 8 (see Table 4.2-1)} \\ l' \bmod 2 + 2 + 3\lfloor l'/2 \rfloor & \text{if in a special subframe with configuration 1, 2, 6, or 7 (see Table 4.2-1)} \\ l' \bmod 2 + 5 & \text{if not in a special subframe} \end{cases}$$ $$l' = \begin{cases} 0,1,2,3 & \text{if } n_s \bmod 2 = 0 \text{ and in a special subframe with configuration 1, 2, 6, or 7 (see Table 4.2-1)} \\ 0,1 & \text{if } n_s \bmod 2 = 0 \text{ and not in special subframe with configuration 1, 2, 6, or 7 (see Table 4.2-1)} \\ 2,3 & \text{if } n_s \bmod 2 = 1 \text{ and not in special subframe with configuration 1, 2, 6, or 7 (see Table 4.2-1)} \end{cases}$$ $$m' = 0,1,2$$ The sequence $\overline{w}_p(i)$ is given by Table 6.10.3.2-1.

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Table 6.10.3.2-1: The sequence $\overline{w}_p(i)$ for normal cyclic prefix.

Antenna port p	$\left[\overline{w}_p(0) \quad \overline{w}_p(1) \quad \overline{w}_p(2) \quad \overline{w}_p(3)\right]$
7	$[+1 \quad +1 \quad +1 \quad +1]$
8	$[+1 \quad -1 \quad +1 \quad -1]$
9	$[+1 \quad +1 \quad +1 \quad +1]$
10	$[+1 \quad -1 \quad +1 \quad -1]$
11	$[+1 \quad +1 \quad -1 \quad -1]$
12	$[-1 \quad -1 \quad +1 \quad +1]$
13	$[+1 \quad -1 \quad -1 \quad +1]$
14	$[-1 \quad +1 \quad +1 \quad -1]$

3.1 Symbols

For the purposes of the present document, the following symbols apply:

(k,l) Resource element with frequency-domain index k and time-domain index l

$a_{k,l}^{(p)}$ Value of resource element (k,l) [for antenna port p]

…

$N_{\mathrm{RB}}^{\max,\mathrm{DL}}$ Largest downlink bandwidth configuration, expressed in multiples of $N_{\mathrm{sc}}^{\mathrm{RB}}$

…

$N_{\mathrm{sc}}^{\mathrm{RB}}$ Resource block size in the frequency domain, expressed as a number of subcarriers

…

n_{PRB} Physical resource block number

…

n_{s} Slot number within a radio frame

…

p Antenna port number

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<td>wherein the reference signal pattern is the demodulation reference signals on 7 OFDM symbols in time domain and 12 subcarriers in frequency domain multiplied by length-2 or length-4 Walsh code OCC mapping according to antenna port</td>
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This limitation is present in the Accused Products. For example, 3GPP standard TS 36.211 3GPP TSG RAN; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation (Release 10), v 10.2.0 (2011-06) describes how the standard provides for the reference signal pattern is the demodulation reference signals on 7 OFDM symbols in time domain and 12 subcarriers in frequency domain multiplied by length-2 or length-4 Walsh code OCC mapping according to antenna port:

TS 36.211 3GPP TSG RAN; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation (Release 10), v 10.2.0 (2011-06)

5.2 Slot structure and physical resources

5.2.1 Resource grid

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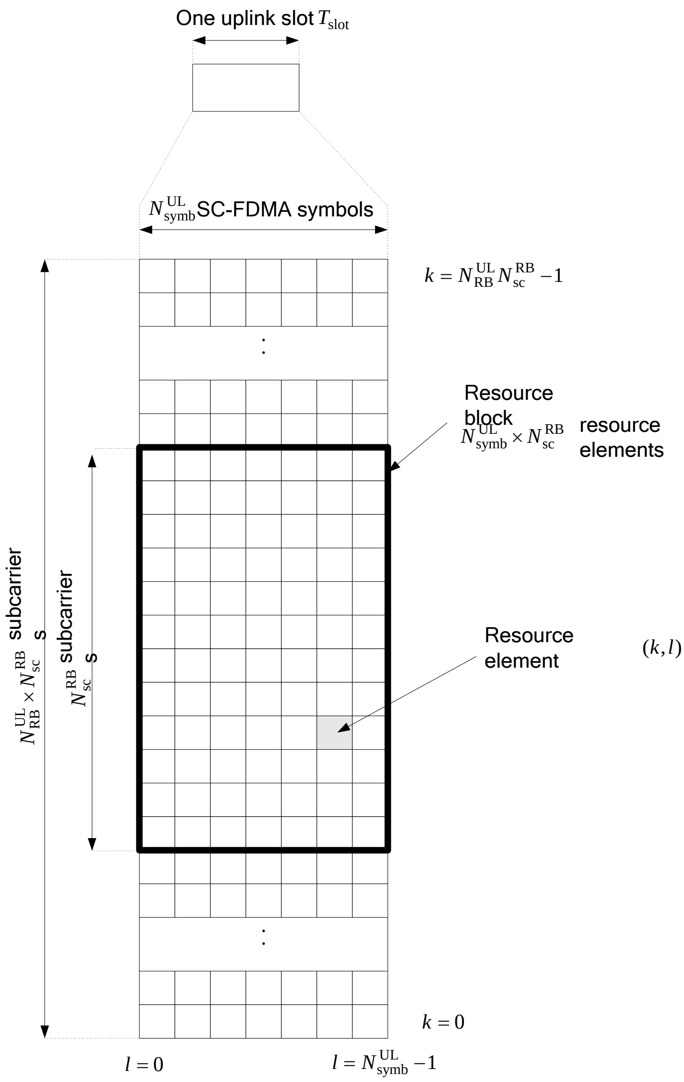

Figure 5.2.1-1: Uplink resource grid

[acer comment: in one resource block, there are 7 OFDM symbols in time domain and 12 subcarriers in frequency domain.]

6.10.3.2 Mapping to resource elements

…

The sequence $\overline{w}_p(i)$ is given by Table 6.10.3.2-1.
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	Table 6.10.3.2-1: The sequence $\overline{w}_p(i)$ for normal cyclic prefix. **Antenna port** p — $[\overline{w}_p(0)\quad \overline{w}_p(1)\quad \overline{w}_p(2)\quad \overline{w}_p(3)]$ 7 — $[+1\quad +1\quad +1\quad +1]$ 8 — $[+1\quad -1\quad +1\quad -1]$ 9 — $[+1\quad +1\quad +1\quad +1]$ 10 — $[+1\quad -1\quad +1\quad -1]$ 11 — $[+1\quad +1\quad -1\quad -1]$ 12 — $[-1\quad -1\quad +1\quad +1]$ 13 — $[+1\quad -1\quad -1\quad +1]$ 14 — $[-1\quad +1\quad +1\quad -1]$ … The sequence $\overline{w}_p(i)$ is given by Table 6.10.3.2-2. **Table 6.10.3.2-2: The sequence $\overline{w}_p(i)$ for extended cyclic prefix.** **Antenna port** p — $[\overline{w}_p(0)\quad \overline{w}_p(1)]$ 7 — $[+1\quad +1]$ 8 — $[-1\quad +1]$
and the direction of length-2 or length-4 Walsh code OCC sequences are mapped reverse, forward and reverse on 14 OFDM symbols in time domain and 12subcarriers in frequency domain.	This limitation is present in the Accused Products. For example, 3GPP standard TS 36.211 3GPP TSG RAN; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation (Release 10), v 10.2.0 (2011-06) describes how the standard provides for the direction of length-2 or length-4 Walsh code OCC sequences are mapped reverse, forward and reverse on 14 OFDM symbols in time domain and 12subcarriers in frequency domain: TS 36.211 3GPP TSG RAN; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation (Release 10), v 10.2.0 (2011-06) 6.10.3.2 Mapping to resource elements … For antenna ports $p=7$, $p=8$ or $p=7,8,\ldots,\upsilon+6$, in a physical resource block with frequency-domain index n_{PRB} assigned for the corresponding PDSCH transmission, a part of the reference signal sequence $r(m)$ shall be mapped to complex-valued modulation symbols $a_{k,l}^{(p)}$ in a subframe according to Normal cyclic prefix: $$a_{k,l}^{(p)} = w_p(l') \cdot r(3 \cdot l' \cdot N_{\mathrm{RB}}^{\max,\mathrm{DL}} + 3 \cdot n_{\mathrm{PRB}} + m')$$ where $w_p(i) = \{ \hat{w}_p(i) \quad (m'+n_{\mathrm{PRB}}) \bmod_2 = 0$

	$\lfloor \hat{w}_p(3\text{-}i) \quad (m'+n_{PRB}) \bmod_2 = 1$ …